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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,640	03/28/2001	Atsushi Koike	35.C15222	2483

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EXAMINER

FULLER, ERIC B

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 09/11/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	09/818,640		KOIKE ET AL.	
	Examiner		Art Unit	
	Eric B Fuller		1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 9-26 is/are pending in the application.
- 4a) Of the above claim(s) 14-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 9-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 9-11, and 13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The independent claims are drawn to a periodically changing voltage having a frequency within a certain range. It is unclear if this frequency is the frequency of the voltage changes or the frequency of the current, if it is to be assumed that the current is an alternating current. This renders the claims vague and confusing.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1, 5, and 9-13 rejected under 35 U.S.C. 102(e) as being anticipated by Raoux et al.

Raoux teaches a process where a high frequency power source is attached to a showerhead, to act as a discharge electrode, in a vacuum vessel equipped with exhaust means (figure 18; column 3, lines 30-40). A low frequency electrode is embedded in the substrate holder (column 8, lines 40-45) to act as the auxiliary electrode. Since the substrate holder is located in the plasma stream, it reads on the electrode embedded in it as being in the stream as well. Hydrogen and silicon are supplied to the substrate in the form of decomposed silane (column 6, lines 30-35) and a silicon comprising film is deposited on the substrate by the CVD process (column 19, line 20). The frequencies of the electrodes are within the applicant's range (column 23, lines 30-40). The voltage of the auxiliary electrode is pulsed and control means are used to control properties of the film (column 4, lines 39-50). The controlling of hydrogen radical generation would inherently occur by these control means. The voltage of the auxiliary electrode is a biasing voltage that is below the potential of plasma and thus does not cause a discharge (column 9, lines 39-55). The auxiliary electrode may comprise a nickel rod that has a small diameter and a small area facing the substrate (column 8, lines 40-50). Examiner concedes that it is not specifically taught that the auxiliary electrode only energizes the electrons, and not the ions. However, since the electrodes and the source materials are the same as that of the applicant's, it is assumed that this phenomenon is inherent to the process of Raoux.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Raoux (US 6,162,709).

Raoux teaches the limitations of claim 1, but fails to explicitly teach the voltage of the auxiliary electrode. However, it is the examiner's position that it would have been obvious at the time the invention was made to a person having ordinary skill in the art to utilize voltages that do not cause discharge, as the electrode is only a biasing electrode. By doing so, voltages within the applicant's claimed ranges would be used.

Additionally to claim 6, to utilize a plurality of auxiliary electrodes would have been obvious at the time the invention was made to a person having ordinary skill in the art in order to obtain added control over the entire deposition area.

Response to Arguments

Applicant argues the definition of "discharge" and alleges that the specification describes in detail that "discharge" means something different than what the examiner has assumed it meaning. This argument is not found persuasive. The part of the specification the applicant has pointed to only defines "without causing a discharge" as "to not generate a discharge..." The proceeding paragraph teaches the criticality of

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maintaining the voltage below the plasma potential. Also in the arguments, the applicant states that the voltage must be below 80 V (the plasma potential) in order to qualify as "without a discharge" (page 8, 1st paragraph), thus supporting the examiners assumption. The arguments are also confusing as it is not clear what the applicant means when the electrons are "affected" (line 5). Therefore, the argument has not been found convincing and the examiner defines "without causing a discharge" as meaning, "not causing plasma to ignite".

Applicant argues that an electrode being below the substrate is not considered being in the plasma stream. In the present action, the auxiliary electrode of the prior art is embedded in the substrate holder (below the substrate). However, the substrate holder is located in the plasma stream. Therefore, the electrode qualifies as being in the plasma stream as well. It is the examiner's interpretation that being "in" the plasma stream and being located between the substrate and the gas distribution means have two different interpretations.

All other arguments pertain to art that has not been used in this office action and do not pertain to the prior art used in the present office action. All arguments have been considered, but these arguments are moot in view of the new grounds for rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Koshimizu (US 6,214,162 B1), Collins et al. (US 6,444,137 B1),

and Koizumi (US 6,435,131 B1) are all relied upon as being pertinent to the applicant's disclosure.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eric B Fuller whose telephone number is (703) 308-6544. The examiner can normally be reached on Mondays through Thursdays.

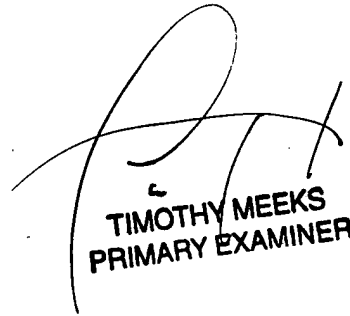
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck, can be reached at (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872-9310 for regular communications and (703) 872-9311 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


EBF
September 9, 2002


TIMOTHY MEEKS
PRIMARY EXAMINER